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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/742,473	12/22/2000	Byung-Soo Ko	3430-0161P	9178
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EXAMINER

NGO, HUYEN LE

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/742,473

Applicant(s)

KO, BYUNG-SOO

Examiner

Julie-Huyen L. Ngo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other:

## **DETAILED ACTION**

### ***Claim Objections***

Claim 12 is objected to because it appears that claim 12 should be depended from claim 7 not claim 11 since there is no third metal layer disclosed in neither claims 9 nor 11, which describe the dual structure containing only two metal layers. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 7 to 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al. (US6172733B1) in view of Kim et al. (US006048783A).

With respect to claims 1, 4, 5, 7, 10 and 11, Hong et al. teach (Figs. 5a-5c, col. 6 lines 37-67) a method of manufacturing an array substrate comprising:

- forming an electrode line (gate line 111) has a first (Al) and second (Mo) metal layers of dual layer structured on a substrate using a wet etching technique
- forming an organic insulating layer (gate insulating layer 117) on an exposed surface of the substrate while covering the electrode line wherein the end portion of the electrode line has a taper angle of more than 45° from a top surface of the electrode lines (see Figures 5d and 5e).

With respect to claims 2 and 8, Hong et al. teach (Figs. 5a-5c, col. 6 lines 61-67) forming an organic insulating layer (gate insulating layer 117) from one of benzocyclobutene, an acrylic-based insulating material or resin.

However, Hong fails to disclose the electrode line having first and second metal layers of a dual-layered structure, and a side portion of the first metal layer is more etched than a side of portion of the second metal layer, as recited in claims 3 and 9.

Kim et al. disclose as a prior (Figs. 2A-C, col. 2 lines 13-29) the electrode line having first and second metal layers of a dual-layered structure, and a side portion of the first metal layer 15 made of aluminum layer 10 is more etched than a side of portion of the second metal layer 14 made of molybdenum layer 11 by simultaneously etching two metal layers. Doing so would reduce the number of masking processes.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a method of manufacturing an array substrate as Hong disclosed by simultaneously etching the first and second metal layers of a dual-layered structure for reducing the number of masking processes, as taught by Kim et al. Doing so would have the side portion of the first metal layer being more etched than a side of portion of the second metal layer.

Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al. as applied to claims 1, 7 and 11 and in view of Kaneko et al (US6404473B1)

Kaneko teach (Figs. 9B-C, col. 9, line 56 - col. 10, line 23) a method of manufacturing an array substrate comprising an electrode line having a three-layered structure by simultaneously etching an upper most metal layer (third metal layer) and

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lowermost metal layer (first metal layer), which sandwiches a middle conductive layer (second metal layer) and have a low corrosion potential, so that a side portion of the second metal layer protrudes beyond side portions of the first and third metal layers. Doing so would suppress the growth of hillock of the second metal layer from the end portion and reduce the processing step.

Therefore, it would have been obvious for one of ordinary skill in the art to form an electrode line on a substrate of Hong device with a first, second, and third metal layers of three-layered structure having a side portion of the second metal layer protrudes beyond side portions of the first and third metal layers, for the reason set forth above, as taught by Kaneko et al.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (703) 305-3508. The Examiner can normally be reached on T-Friday.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Robert H. Kim can be reached at (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-4709 for regular communications and (703) 746-4709 for After Final communications. Please contact the Examiner before faxing any paper to the Office.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



*Julie-Huyen L. Ngo*

**Patent Examiner  
Art Unit 2871**